

# Assessment of vulnerabilities to multifaceted stressors and adopting a systems thinking approach to enhance resilience in fisheries socio-ecological systems to promote sustainable practices: A case from Sri Lanka

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## Introduction

This study focuses on addressing the vulnerabilities and adaptive capacities of fisheries socio-ecological systems (SES) to multifaceted stressors and investigating resilience-building strategies through a systems-thinking approach. Using case studies from Sri Lanka, it employs a multidisciplinary, participatory approach and advanced modeling techniques to analyze vulnerabilities, simulate socio-ecological dynamics, and inform policy recommendations for sustainable adaptation.

## Aims:

Propose a mechanism to assess vulnerabilities of fisheries SES to multifaceted stressors and to investigate how resilience building can be facilitated through a systems thinking approach.

## Objectives:

Propose an integrated framework and use a mixed-method approach to recognize the factors that drive vulnerabilities in fisheries' socio-ecological systems.

Develop systems models to simulate feedback loops, thresholds, tipping points, and their impacts on socio-ecological dynamics influencing vulnerabilities.

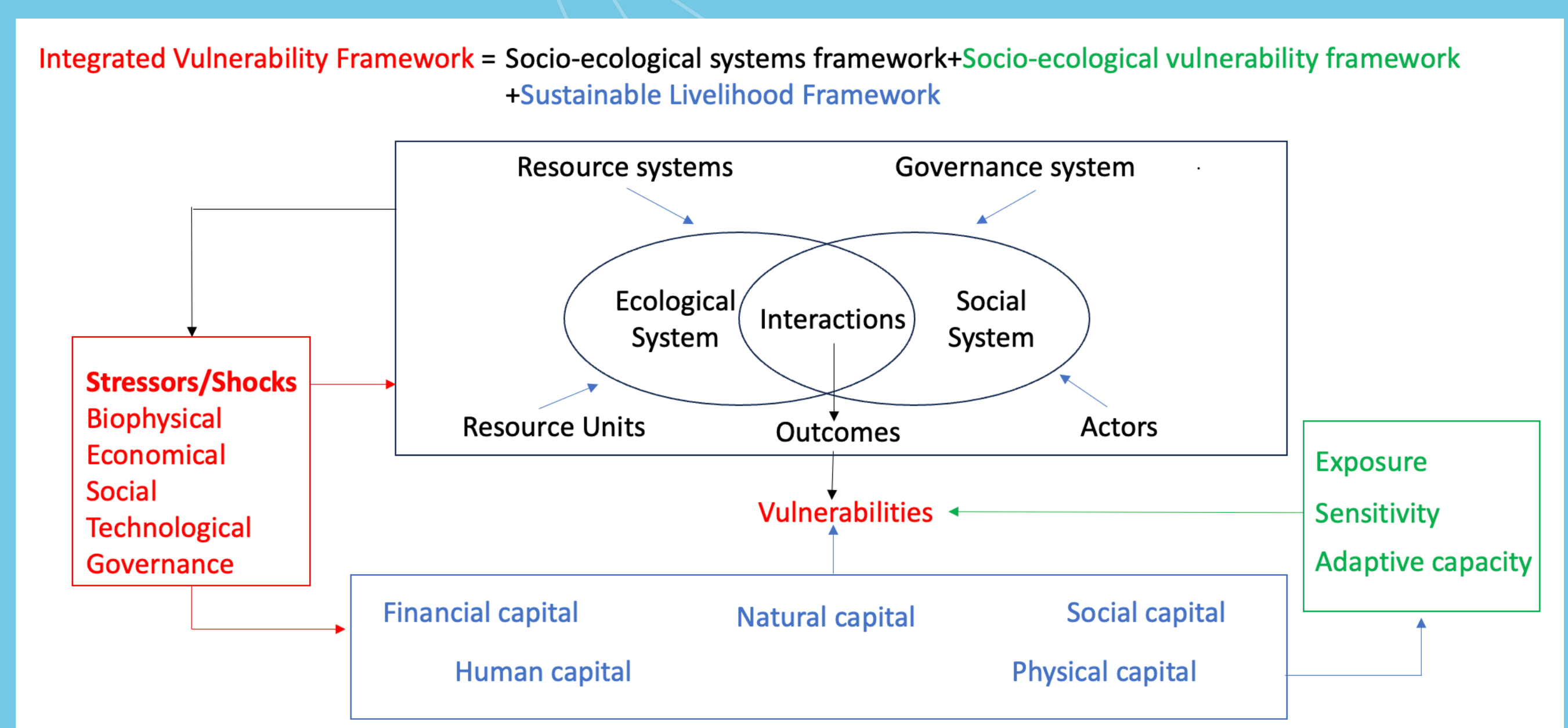
Propose policy recommendations to build community resilience.

## Methodology

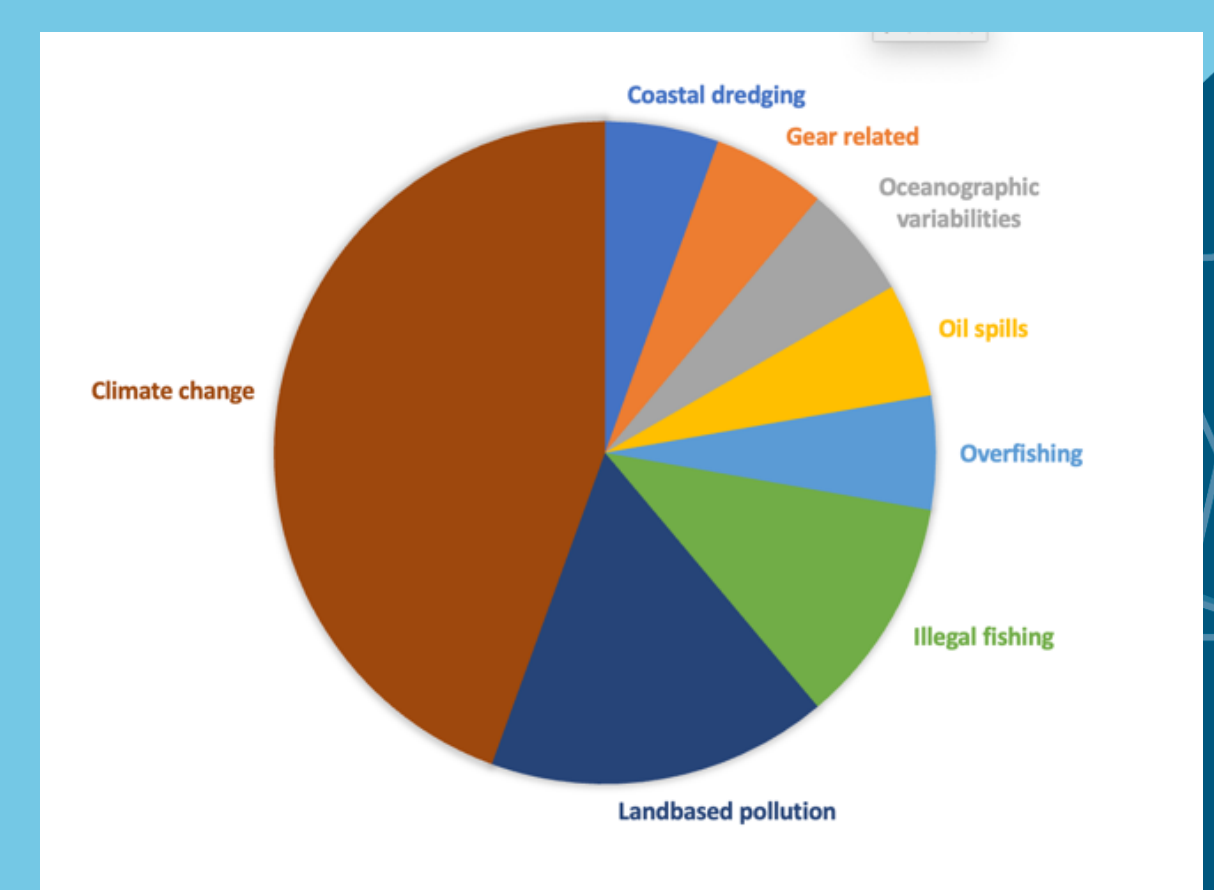
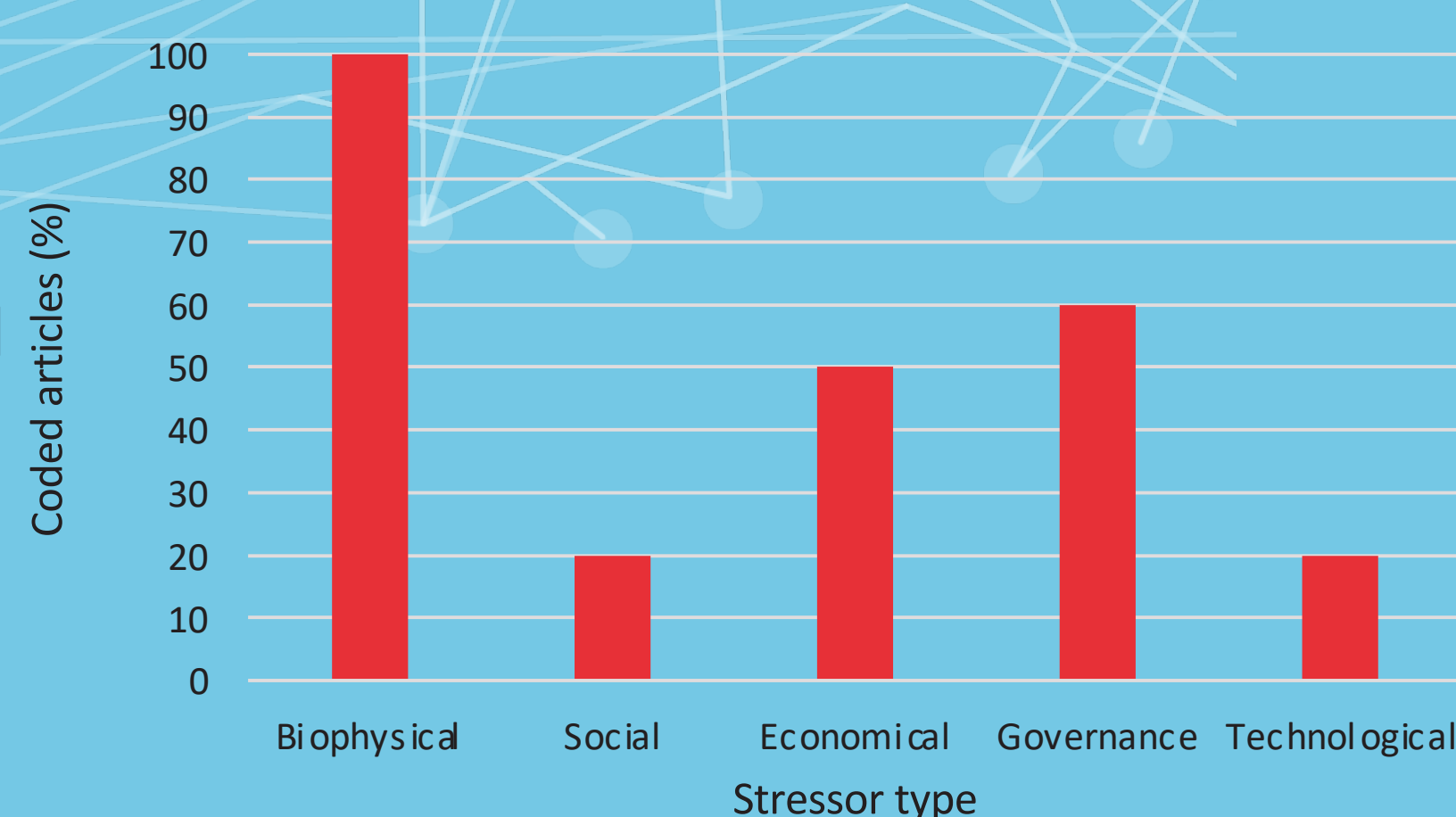
1. Systematic literature review to identify the global trends of stressors driving vulnerabilities in fisheries SES.
2. Development of indicators and determining variables for vulnerability assessments and systems maps: Through a participatory approach
3. Systems mapping and system dynamic modelling.

## Recent results

1. Integrated vulnerability framework (DFID, 1999), (Ostrom, 2009), (Turner et al, 2003)



2. Multifaceted stressors that drive vulnerabilities in fisheries SES

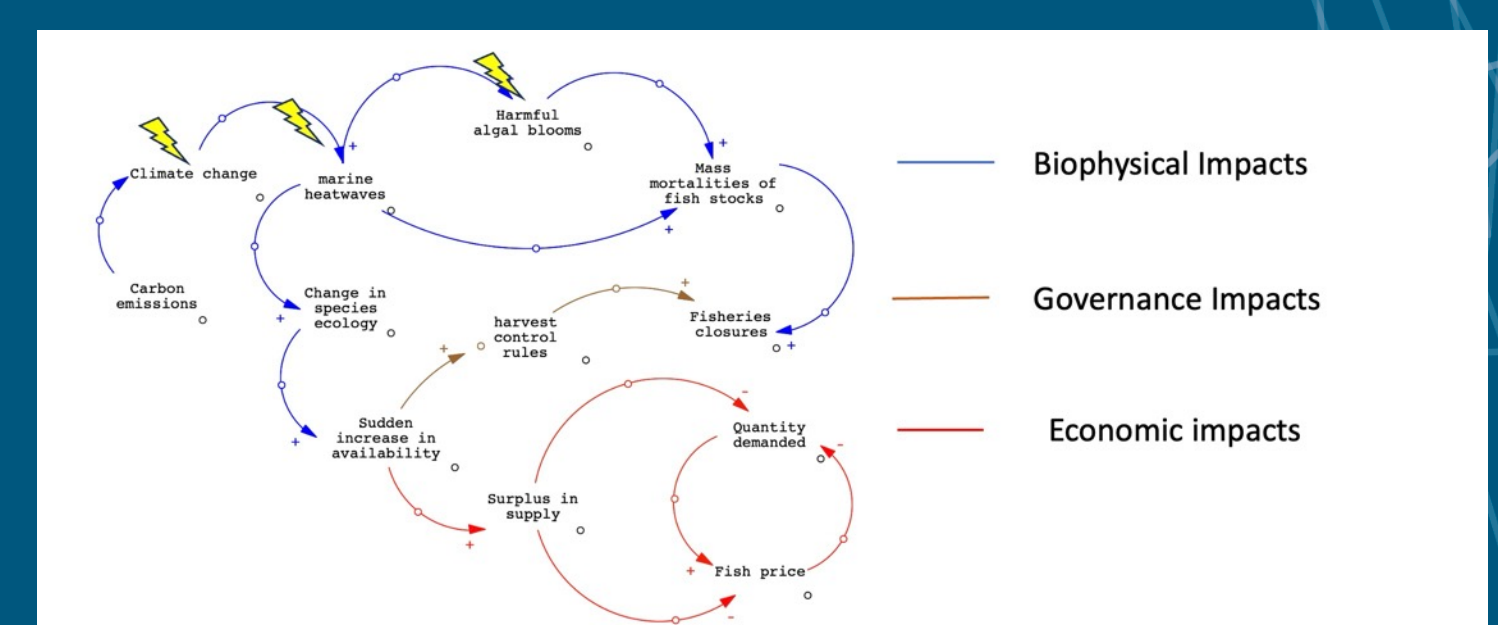


## Ongoing and planned work

Survey and interviews with stakeholders



Visualizing system dynamics



## References:

DFID. (1999). Key Sheets for Sustainable Development: Overview.

Ostrom, E. (2009). A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science*, 325(5939), 419–422.

Turner, B. L., Kasperson, R. E., Matson, P. A., McCarthy, J. J., Corell, R. W., Christensen, L., Eckley, N., Kasperson, J. X., Luers, A., Martello, M. L., Polsky, C., Pulsipher, A., & Schiller, A. (2003). A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences*, 100(14), 8074–8079.